CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES FOR FLUVIAL ARCTIC GRAYLING IN THE UPPER BIG HOLE RIVER



Montana Fish, Wildlife & Parks

2010 Annual Report

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Emily Cayer, Austin McCullough, & Jim Magee
Montana Fish, Wildlife & Parks

The Candidate Conservation Agreement with Assurances for Fluvial Arctic Grayling in the Upper Big Hole River State and Federal Agency Partnership includes:

Montana Fish, Wildlife & Parks
USDA Natural Resources Conservation Service
Montana Department of Natural Resources and Conservation
U.S. Fish and Wildlife Service
USFWS Partners for Fish and Wildlife Program

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I. Introduction

A Candidate Conservation Agreement with Assurances (CCAA) is an agreement between the U.S. Fish and Wildlife Service (USFWS) and any non-Federal entity. Under the agreement, non-Federal property owners voluntarily agree to manage their properties to remove threats to sensitive species. In return, the non-Federal property owners receive assurances against additional regulatory requirements should that species be subsequently listed under the Endangered Species Act (ESA).

The CCAA conservation goal for fluvial (river dwelling) Arctic grayling *Thymallus arcticus* (grayling) in the Upper Big Hole River (Big Hole Grayling CCAA) is to secure and enhance the grayling population within the upper reaches of their historic range in the Big Hole River drainage. Under the Big Hole Grayling CCAA, Montana Fish, Wildlife & Parks (FWP) holds an ESA section 10(a)(1)(A) Enhancement of Survival Permit issued by USFWS on August 1, 2006. Under this permit, FWP will issue Certificates of Inclusion to non-Federal property owners within the Project Area who agree to comply with all of the stipulations of the Program and develop site-specific conservation plans (SSP) (Figure 1). Site-specific conservation plans will be developed with each landowner by an interdisciplinary technical team made up of individuals representing FWP, USFWS, USDA Natural Resources Conservation Service (NRCS), and Montana Department of Natural Resources and Conservation (DNRC) (collectively the Agencies). The conservation guidelines of the Big Hole Grayling CCAA will be met by implementing conservation measures that:

1) Improve streamflows

2) Improve and protect the function of riparian habitats

3) Identify and reduce or eliminate entrainment threats for grayling

4) Remove barriers to grayling migration

This planning effort will help alleviate private property concerns, as well as generate support from private landowners which will improve habitat conditions for grayling throughout the Project Area. The CCAA program goal is to increase the abundance and distribution grayling within the Project Area (FWP and USFWS 2006).

The Big Hole Grayling CCAA is a collaborative effort among private landowners, state and federal agencies, and non-government organizations. These stakeholders have agreed to work together for the common goals of conserving grayling, improving the local fisheries, addressing private property concerns, maintaining the current land ownership dynamics, and enhancing the overall health of the upper Big Hole watershed.

The 2010 report includes current enrollment, a summary of approved SSP, and a summary of conservation actions implemented in 2010 as part of the Big Hole Arctic Grayling CCAA. For grayling population monitoring data refer to the Montana Arctic Grayling Monitoring Report online at:
http://fwp.mt.gov/wildthings/concern/arcticGraylingReports.html

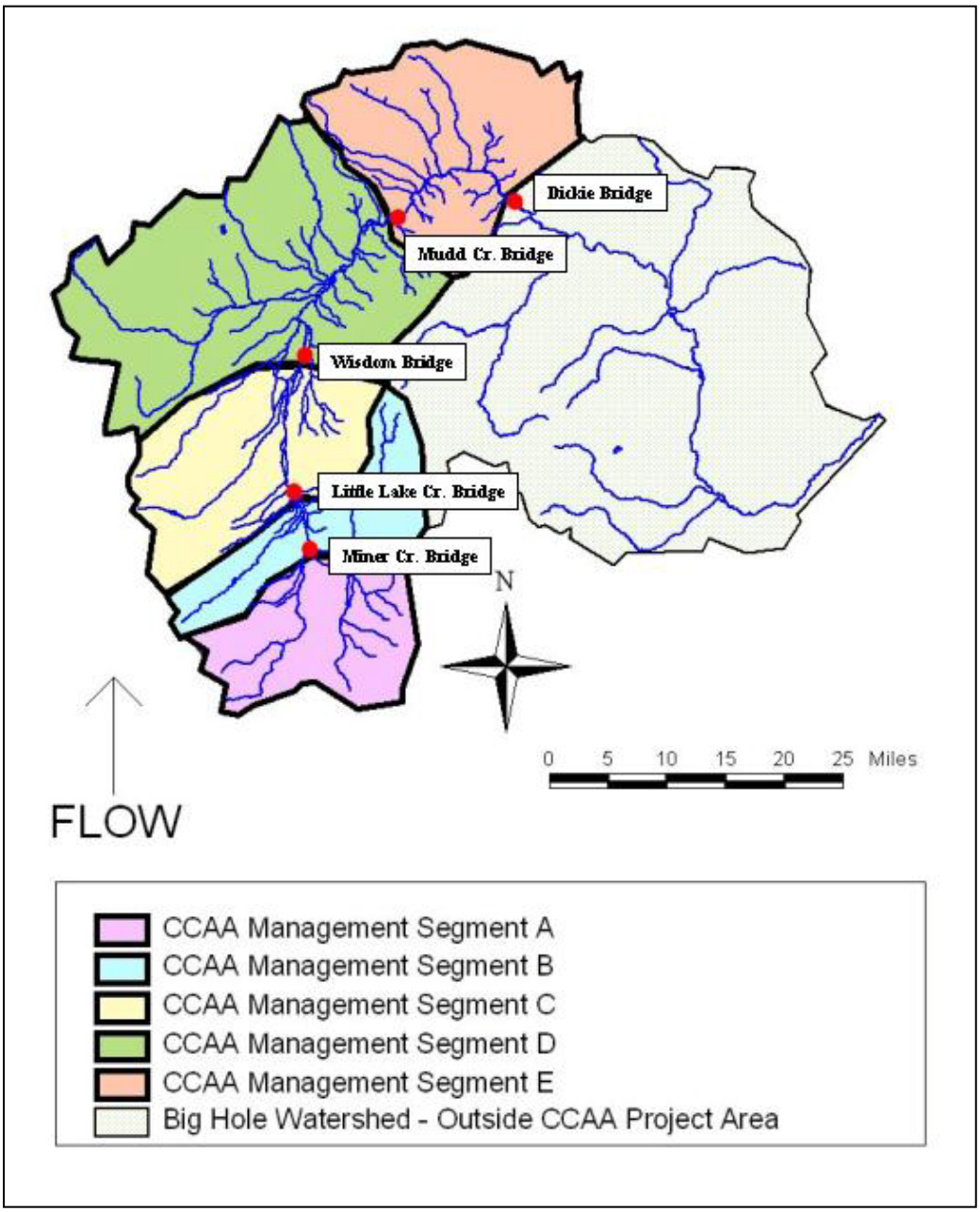

Figure 1. The Big Hole Grayling CCAA Project Area and Management Segments.

II. Legal Status of Montana Arctic Grayling

Montana Arctic grayling have been listed as a Montana species of concern for many years. In addition, Montana Arctic grayling have a long (since 1982) ESA petition history including several status reviews that have been published in the Federal Register (47 FR 58454), and legal challenges. Recent findings include a revised 12-month finding published in April 2007 for a petition to list the upper Missouri River Distinct Population Segment (DPS) of fluvial Arctic grayling as threatened or endangered. The 2007 finding determined that the grayling population in the Big Hole basin did not constitute a species, subspecies or DPS and therefore was not a list-able entity. This action removed Big Hole grayling from the Candidate Species List (72 FR 20305). In November 2007, a number of non-government organizations filed a complaint to challenge the USFWS decision. In the settlement agreement, the USFWS agreed to publish a new status review finding on or before August 30, 2010. As part of the settlement, the USFWS agreed to consider the appropriateness of a Distinct Population Segment (DPS) designation that included different life histories for Arctic grayling populations throughout the entire the upper Missouri River basin. On September 8, 2010, the USFWS published their finding that upper Missouri River basin Arctic grayling qualify as a DPS, that listing as threatened or endangered under the Endangered Species Act was warranted, but listing at that time was precluded due to higher priority species The finding included all life history types (fluvial and adfluvial) that occur naturally in the Missouri River basin (75 FR 54708). The current legal status of grayling supports the need to continue conservation actions through the Big Hole Arctic grayling CCAA program and address limiting habitat factors on non-federal property.

III. Landowner Enrollment

On August 1, 2006 the USFWS issued FWP an ESA section 10(a) (1) (A) Enhancement of Survival Permit # TE-104415 authorizing the Big Hole Grayling CCAA. Enrolled non-federal landowners are provided incidental take and regulatory assurances once the non-federal landowner, FWP, and the USFWS counter-sign the Certificate of Inclusion and approve the SSP for the enrolled property. In 2010, two private landowners purchased property that was already enrolled in the CCAA (approximately 4,103 acres total). The change in ownership resulted in two new enrollees; however, there was no net change in total enrolled acres for the program. In 2010, one landowner un-enrolled 4,230 acres of private land, after it was determined the participating landowner could not meet the requirements of the program. Currently, there are 33 landowners (Participating Landowners) that have enrolled 155,357 acres of private and 9,690 acres of state land into the Big Hole Grayling CCAA (Table 1, Figure 2). Enrollment for the Big Hole Grayling CCAA will remain open until 90 days prior to a proposed grayling ESA listing date published by the USFWS in the Federal Register. As of January 1, 2011 the USFWS had counter-signed 29 of the 33 Certificates of Inclusion signed and submitted by FWP. The remaining four Certificates of Inclusion will be cosigned after initial assessments of the properties for immediate threats to grayling and water rights compliance have been completed and submitted to the USFWS.

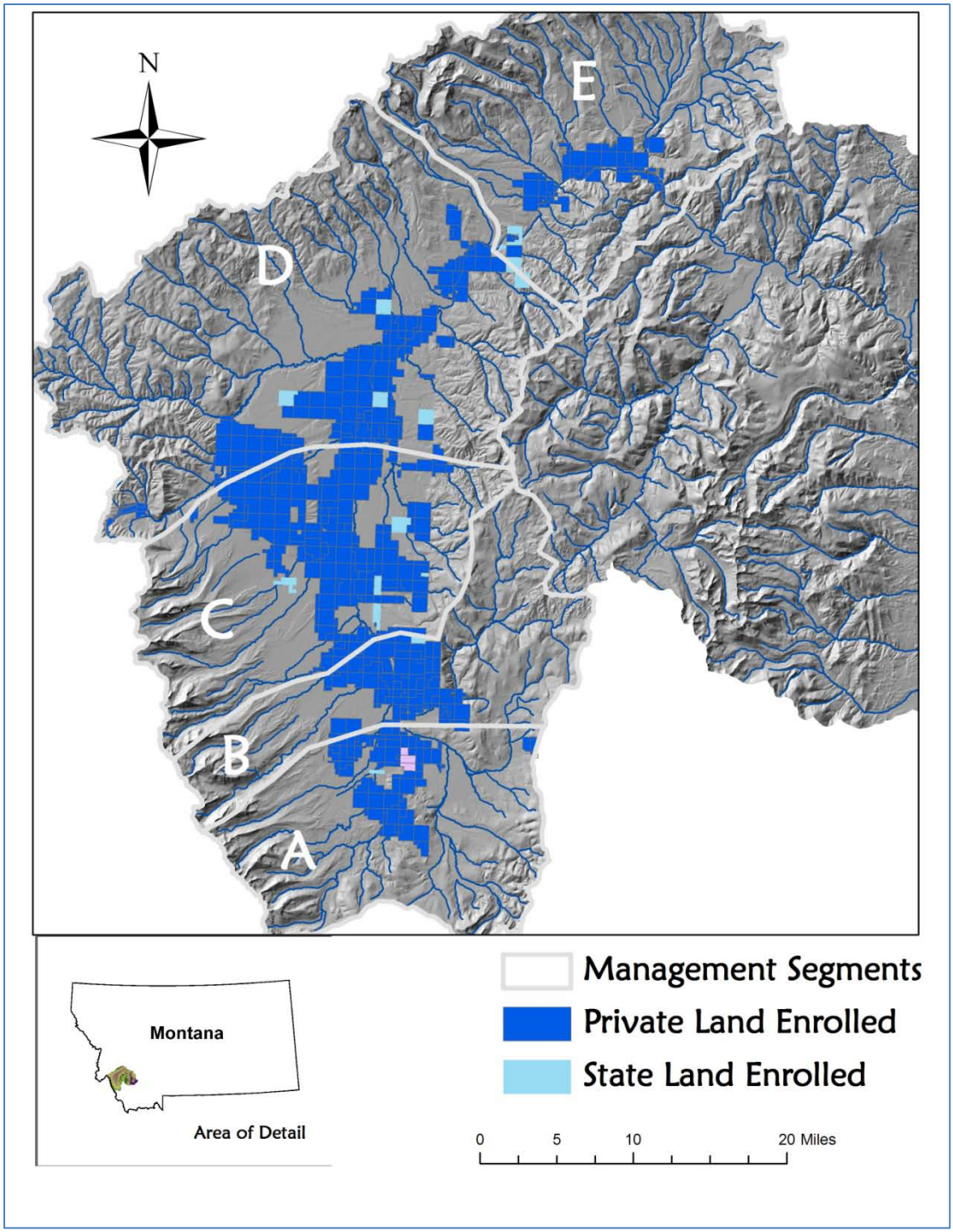

Figure 2. Big Hole Arctic grayling CCAA project area showing Management Segments A-E and enrolled non-federal land (private and state) as of January 1, 2011.

Table 1. Landowner, year enrolled, CCAA management reach, number of private acres enrolled, number of state lease acres enrolled, enrollment status.

Landowner\Date Enrolled	Mgmt Segment(s)	Private Land Enrolled (Acres)	State Land Enrolled (Acres)	Enrollment Status
Ernest Bacon (2007)	E	980	0	Enrolled; COI signed
Beartooth Capital (2010)	C &D	2,011	1,600	Enrolled; COI signed by landowner
Big Hole Grazing Association (2006)	C&D	4,575	0	Enrolled; Extension approved
Big Hole River LLC. (2006)	D	1,473	0	Enrolled; Extension w/landowner
Christiansen's East Bench (2007)	E	6,336	1,280	Enrolled; COI signed
Circle 3 Land & Cattle, LLC (2009)	C	2,260	0	Enrolled by Previous Owner
Diamond Ranch (2008)	A	4,393	1,620	Enrolled; COI signed
Dooling Livestock Company (2006)	A	6,300	640	SSP Completed
Erb Livestock Co (2006)	C&D	23,174	560	Enrolled; Extension approved
Finch Ranches, LLC (2007)	B	1,052	0	Enrolled; Extension in progress
Foster Company (2006)	C	2,140	400	Enrolled; COI Approval Pending
H Lazy J Ranch - Tom Mitchell (2006)	A&B	3,370	640	Enrolled; Extension approved
Harrington Company (2007)	C&D	8,334	640	Enrolled; COI signed
Dick Hirschy / Heidi Hirschy (2007)	A, B,C&D	24,136	0	Enrolled; Extension processed
Fred and Lynn Hirschy (2007)	C	1,550	0	Enrolled; COI signed;
Jack Hirschy Livestock, Inc. (2007)	C&D	14,787	0	Enrolled; COI signed
Ralph Huntley and Son, Inc. (2006)	C	9,200	560	Enrolled; Extension approved
Husted Ranches, Inc. (2006)	B&C	3,744	0	Enrolled; Extension approved
Johnson Brothers, Inc. (2006)	B&C	2,490	0	SSP Completed
LaMarche Creek Ranch (2006)	E	1,670	0	SSP Completed
Lapham Ranch Company (2006)	A&B	7,000	0	SSP Completed
John Nelson (2007)	C&D	3,340	640	Enrolled; COI signed
Peterson Brothers Cattle Co (2007)	A&B	2,400	400	Enrolled; COI signed
Quarter Circle 3T Ranch (2007)	D	2,530	640	Enrolled; COI signed
Ralston Ranch, Inc. (2006)	E	2,773	0	Enrolled; Extension approved
Stanley Rasmussen (2006)	D	160	0	Enrolled; Extension approved
Reinhardt Ranch Company (2006)	E	900	70	Enrolled; Extension approved
Rocky Mountain Ranches (2006)	B	3,445	0	Enrolled; COI summary completed
Rufenacht Land & Cattle	D	1109	0	Enrolled; COI in progress
K.L. Spear (2007)	E	700	0	Enrolled; COI signed
Upper Big Hole LLC. (2006)	A	3,100	0	SSP Completed
Weaver Ranch (2007)	D	680	0	Enrolled
Wisdom River Cattle Co (2006)	C	3,245	0	SSP Completed
Totals		155,357	9,690	

IV. Big Hole Grayling CCAA Rapid Assessments

The Participating Landowners in the Big Hole Grayling CCAA must allow the Agencies to conduct a "rapid assessment" of the enrolled property within 90 days of enrolling into the Big Hole Grayling CCAA. The rapid assessment focuses on the identification of immediate mortality threats to grayling and the validation of water rights compliance. Immediate threats to grayling may include structures, mechanical devices or pollutants that may cause grayling mortality. Examples include: unscreened pumping from a creek or river, or toxic effluent entering into a creek or river. Additional information may be gathered through the assessments that assist with the development of the SSP with the Participating Landowner

A. Surveys for Immediate Threats to Grayling

Surveys for immediate threats to grayling have been conducted on all enrolled properties. No immediate threats to grayling were identified during the surveys. Monitoring of enrolled property for immediate threats continues as SSP are being developed by the Agencies.

B. SSP Water Rights Compliance Evaluation

The 2010, water rights compliance efforts completed by DNRC included discharge measurements on diversions used by 16 Participating Landowners (5 with completed SSP).

C. Rapid Assessment Water Rights Compliance

Initial water rights compliance associated with the rapid assessment was conducted on the Circle 3 Land and Cattle property (King Ranch) on 07/22/2010. This property subsequently sold and the new landowner has not yet enrolled in the CCAA program. To assist with developing flow conservation plans continuous flow monitoring was completed on five irrigation ditches including the Spokane and Farris (Erb Livestock), Huntley (Ralph Huntley & Sons), and Strowbridge and McVey (Harrington Ranch).

V. Site-Specific Conservation Plans

Each SSP is developed for enrolled lands by the Participating Landowner and the Agencies and are ten-year agreements between the Participating Landowners, FWP, and the USFWS. The SSP identifies and implements conservation actions that will lead to: improved streamflows, enhanced riparian and stream channel condition, improved fish passage and reduced levels of entrained grayling. Updates on the implementation of these SSP, including compliance monitoring results, will be included future annual reports.

A. Completed and Approved

Four SSPs were completed and approved for enrolled landowners during 2010: The Wisdom River Cattle Co. (COI# Big Hole Grayling CCAA – 0007) on February 9, Johnson Brothers Inc (COI# Big Hole Grayling CCAA – 0029) on July 8, 2010, the LaMarche Creek Ranch (COI# Big Hole Grayling CCAA – 0024) on November 12, and Lapham Ranch (COI# Big Hole Grayling CCAA – 0034) plan was completed on November 26, 2010.

B. Extension Requests Approved by the USFWS
As of January 1, 2011, USFWS has approved extensions to complete SSP on nine properties enrolled in the Big Hole Grayling CCAA (Table 1). Extension allows the agencies and the Participating Landowner 24 additional months to complete the SSP.

VI. Conservation Measures

Through the process of developing SSP for Participating Landowners, the Agencies identify projects that improve streamflows, improve and protect the function of riparian habitats, identify and reduce or eliminate entrainment threats for grayling, and remove barriers to grayling migration on the enrolled properties. The following projects and related conservation efforts were completed in 2010.

A. Entrainment Surveys
In 2010, FWP completed entrainment surveys on approximately 12.4 miles of irrigation ditch on seven enrolled properties (Table 2). A total of 38 grayling were captured during entrainment surveys. Entrained grayling were relocated to the nearest point of the Big Hole River or tributary downstream of the irrigation structure responsible for entrainment (FWP and USFWS 2006). Other fish species captured during the surveys include: brook trout *Salvelinus fontinalis*, brown trout *Salmo trutta*, rainbow trout *Oncorhynchus mykiss*, mountain whitefish *Prosopium williamsoni*, burbot *Lota lota*, longnose dace *Rhinichthys cataractae* mottled sculpins *Cottus bairdi*, and long nose suckers *Catostomus commersoni and white* suckers *Catostomus catostomus*.

Fourteen grayling were captured in irrigation ditches from diversions located on the North Fork of the Big Hole River (North Fork). Twenty-four grayling were captured in ditches from diversions located on Rock Creek. All grayling captured in Rock Creek ditches were young-of-the-year (<6 inches in length) and assumed to be produced from of Remote Site Incubators (RSIs) that were used in June 2010 to reestablish graying in Rock Creek (See section D. Projects to Expand Grayling Distribution into Historically Occupied Waters, pg. 10).

Table 2. Entrainment surveys in 2010 included 12.4 miles of ditch surveyed and 38 grayling captured.

Date	Source	Miles	Arctic Grayling Captured
Jul-10	Big Hole River	0.26	0
Jul-10	Big Hole River	0.20	0
Jul-10	Big Hole River	0.26	0
Jul-10	Big Hole River	0.46	0
Jul-10	Big Hole River	0.38	0
Oct-10	Big Hole River/Rock Creek	0.28	3
Jul-10	Little Swamp Creek	0.05	0
Aug-10	Rock Creek	0.51	21
Aug-10	Rock Creek	0.42	0
Aug-10	Rock Creek	0.81	0
Aug-10	Rock Creek	0.20	0
Aug-10	Rock Creek	0.59	0
Aug-10	Rock Creek	0.49	0
Jul-10	Swamp Creek	1.61	0
Sep-10	North Fork BHR	0.77	0
Sep-10	North Fork BHR	0.81	1
Sep-10	North Fork BHR	0.74	10
Sep-10	North Fork BHR	0.59	2
Sep-10	North Fork BHR	0.11	0
Sep-10	North Fork BHR	1.34	1
Jul-10	Howell Creek	0.28	0
Jul-10	Howell Creek	1.27	0

B. Projects to Minimize or Eliminate Entrainment of Grayling

Designs for fish exclusion devices (fish screens) previously pursued by the Agencies have not been suitable due to site-specific conditions (low gradient) and biology of grayling (e.g., size of fry). Therefore, efforts have been focused on changing the placement of irrigation diversions to reduce entrainment. In 2010, U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program secured funding through the NRCS's Conservation Innovation Grant to design a fish exclusion device for grayling in the Big Hole River.

C. Projects to Enhance Fish Passage

No fish passage improvement projects were completed in 2010. FWP, NRCS, DNRC and Participating Landowners have initiated six fish passage improvement projects that are expected to be completed in 2011.

D. Projects to Enhance Riparian and Stream Channel Habitat

In 2010, FWP partnered with NRCS, USFWS, DNRC and Participating Landowners to implement nine projects on 8 enrolled properties to protect and/or enhance stream function and riparian habitat (Tables 3 and 4).

Table 3. Riparian and stream channel improvement projects completed in 2010.

Stream\River	Landowner(s)	Project Component	Cost
Big Hole River	Harrington Company	Riparian Fence(1,901 feet)	$9,745
Governor Creek	H Lazy J	Riparian Fence(3,900 feet)	$17,736
Big Lake Creek	Big Hole Grazing Association	Restoration Design	$450
Steel Creek	Harrington Company	Riparian Fence(14,271 feet)	$50,916
North Fork BHR	Erb Livestock	Restoration Design	$8,975.57
North Fork BHR	Erb Livestock	Riparian Fence (1,745 feet)	$14,005
Fishtrap Creek	Ernest Bacon	Riparian Fence(2,200feet)	$3,000
Big Hole River	Upper Big Hole, LLC	Willow Planting (7,400 Willows)	$11,840

Table 4. Noxious weed treatment (number of Acres) for non-federal property enrolled in the Big Hole Arctic Grayling CCAA Program in 2010 (FWP license dollars and BLM).

Stream River	Landowner(s)	Acres Treated	Cost
Big Hole River	Dick Hirschy Cattle, Inc., Erb Livestock Company	1443	$6190.47
Rock Creek	Erb Livestock Company	25	$107.25
Steel Creek	Harrington Cattle Company	79	$338.91
Swamp Creek	Erb Livestock Company, Harrington Cattle Company, John Nelson	118	$506.22
Warm Springs Creek	Finch Ranches, LLC	61	$261.69
Big Swamp Creek	Peterson Brothers Cattle Company	1.5	$6.43
Miner Creek	Husted Ranches, Inc.	133	$570.57

E. Projects to Improve Stream Flows and Irrigation Water Management

In 2010, FWP partnered with NRCS, USFWS, DNRC and Participating Landowners to implement 12 projects on nine enrolled properties to enhance the ability to control and measure irrigation withdrawals and reduce the need to divert water for livestock (Table 5).

Table 5. Projects completed in 2010 to improve streamflows and irrigation water management**.**

Associated Water Body	Landowner(s)	Project Component	Cost
Big Hole River	Husted Ranches, Inc.	Irrigation Diversion Improvement Design	$8,923
Big Hole River	Husted Ranches , Inc.	Diversion control structure\efficiency	$4,788
Big Hole River	Dick Hirschy Cattle Company – Woody Ranch	Diversion Control Structure (12)	$23,726
Big Hole River	Ralston	Measuring Device	$1,050
Berry Creek	Dooling Livestock Co.	Diversion Control Structure, Measuring Device	$4,270
Berry Creek	Dooling Livestock Co.	Cultural Inventory	$189
Little Swamp Creek	Dooling Livestock Co.	Diversion Control Structures (2), Measuring Device (2)	$7,470
Little Swamp Creek	Dooling Livestock Co.	Cultural Inventory	$189
Rock Creek	Foster Land and Cattle Co	Diversion Control structure, measuring device	$5,025
Swamp Creek	John Nelson	Stock Well Solar Pumps	$3,031
North Fork BHR	Erb Livestock Company	Irrigation Diversion Improvement Design	$20,490
Pintlar Creek	Christiansen	Measuring Devices (2)	$2,367
Squaw Creek	Christiansen	Diversion Control structure, Measuring Device	$4,337
LaMarche Creek	LaMarche Creek Ranch	Stock Wells	$476
Deep Creek	Ralston	Diversion Control Structure, measuring device	$8,858
French Creek	Ralston	Stock Well	$7,600

Improvements in irrigation infrastructure, will allow the Participating Landowners the ability to better measure and control diverted flows that are essential to instream flow conservation. In 2010, when flows declined to the established CCAA low flow targets, 10 landowners reduced irrigation diversions resulting in over 80 cubic feet per second (cfs) of flow returning to the Big Hole River or its tributaries (Table 6).

Table 6. Summary of reduced diversions by enrolled landowners to improve streamflows in 2010.

Date	Landowner	Source	Ditch	Returned to Stream (cfs)
5/15-16/10	Upper Big Hole LLC	Big Hole River	Kirk, Company, Home, Warm Springs	27.58
5/20/2010	Huntley	Big Hole River	Turner/Dishno	23.1
5/20/2010	Erb Livestock	Big Hole River	Miller	11.2
8/4/2010	Erb Livestock	Rock Creek	Morton Ditches (East)	1.80
8/4/2010	Erb Livestock	Rock Creek	Morton Ditches (West)	1.50
8/4/2010	Erb Livestock	Rock Creek	Pendleton	1.60
8/5/2010	Erb Livestock	BigHole River	Spokane	5.00
8/18/2010	Erb Livestock	BigHole River	Spokane	5.00
9/1/2010	Erb Livestock	Rock Creek	Pendleton	0.47
9/3/2010	Erb Livestock	Rock Creek	Pendleton	1.02
9/9/2010	Erb Livestock	Rock Creek	Montgomery	0.25
9/9/2010	Erb Livestock	BigHole River	Spokane	2.40

F. Projects to Expand Grayling Distribution into Historically Occupied Waters

One of the Big Hole CCAA Program goals is for grayling to reoccupy or utilize habitats in historic waters in the Big Hole drainage within 10 years of the inception of the Big Hole CCAA program (FWP and USFWS 2006). In 2010, efforts were made to reestablish grayling into Rock Creek a historically a productive spawning and rearing tributary (Shepard and Oswald 1988). In the early 1990's the relocation of an irrigation diversion intercepted Rock Creek and connectivity to the Big Hole River was lost. In 2006, a project was completed that established connectivity to the Big Hole River by constructing a new channel. Extensive monitoring efforts during the three years following the project's completion captured only one grayling. Because the existent Big Hole Arctic grayling population did not colonize the newly connected Rock Creek, in 2010, FWP used Remote Sites Incubators (RSIs) to introduce Arctic grayling back into Rock Creek. The goal is to establish grayling into Rock creek that will enhance distribution and abundance of grayling in the Big Hole drainage. In 2010, approximately 20,000 fertilized eggs taken from the Big Hole conservation grayling brood stock were placed in 20 RSI. From June 1 thru June 17 electrofishing surveys of Rock Creek captured 401 young-of-the-year grayling produced from the RSIs. This effort will continue until 2014 with the goal of establishing multiple year classes and imprinting grayling into Rock Creek so mature grayling return to spawn.

VII. Monitoring

The Big Hole Grayling CCAA has established monitoring requirements to evaluate biological response from restoration actions and to monitor SSPs compliance. To spatially evaluate conservation actions, monitoring occurs in each CCAA reach (A-E) on one mainstem and one tributary reach (Figure 1). Fish population demographics, stream temperature, stream flow and channel morphology are monitored on each of the ten reaches (FWP and USFWS 2006). Mainstem reaches are located near the lower boundary of each Big Hole CCAA segment (A - E) and tributary reaches include Governor Creek, Miner Creek, Rock Creek, Steel Creek and Deep Creek. Additional monitoring is conducted to determine compliance of approved site-specific plans and to evaluate specific restoration projects.

A. Fish Population Monitoring

In 2010, FWP conducted electrofishing surveys to characterize abundance and distribution of grayling and other species within the 10 designated sampling reaches (A-E) which include 19.2 miles of mainstem and 8.75 miles in tributaries (Table 7). A total of 3,638 fish were captured including Arctic grayling, brook trout, brown trout , rainbow trout , and burbot. In 2010, a total of 581 grayling were captured, of which 524 were young-of-the-year. Data from 7 additional mainstem and 11 tributary surveys are presented in Appendix A.

Table 7. The number of fish per mile captured during fall one-pass electrofishing surveys of the Big Hole CCAA monitoring reaches.

Electrofishing Survey Reach	Reach Length\Miles	Arctic Grayling\ mile	Brook Trout\mile	Rainbow Trout\mile	Brown Trout\mile	Burbot\mile
Big Hole CCAA (A)	1.59	0	125.8	5.0	0	10.7
Governor Creek (A)	1.14	0	68.4	0.9	5.3	0.9
Big Hole CCAA (B)	2.51	0	59.4	6.0	20.3	1.2
Miner Creek (B)	0.60	0	53.3	0	1.7	0
Big Hole CCAA (C)	6.32	0.6	23.6	0.3	0.50	1.6
Rock Creek (C)	2.13	148.8	78.4	0	0.50	8.0
Big Hole CCAA (D)	4.40	4.8	4.1	4.1	1.4	0
Steel Creek (D)	3.47	6.3	125.4	0	0.6	13.0
Big Hole CCAA (E)	4.34	0.2	1.2	11.1	12.7	0
Deep Creek (E)	1.41	9.2	55.3	103.6	38.3	5.0

B. Stream Temperature Monitoring

Stream temperatures were monitored in the ten Big Hole CCAA management segments from May 1 – October 15, 2010. Temperatures are summarized by reach as the mean, maximum, and hours exceeding seventy-seven degrees Fahrenheit, the upper incipient lethal temperature for grayling (Lohr et. al. 1996; Table 8).

Table 8. Stream temperature monitoring results for 2010.

Monitoring Site	Mean Temperature ˚F	Maximum Temperature ˚F	Hours Exceeding 77˚ F
Big Hole CCAA (A)	51.1	69.6	0
Governor Creek (A)	51.8	74.21	0
Big Hole CCAA (B)	53.84	67.93	0
Miner Creek (B)	53.8	72.05	0
Big Hole CCAA (C)	55.28	73.65	0
Rock Creek (C)	55.25	73.24	0
Big Hole CCAA (D)*	55.99	75.68	0
Steel Creek (D)	56.64	74.77	0
Big Hole CCAA (E)	55.07	72.7	0
Deep Creek (E)	52.1	68.19	0

*Data from this site was excluded from 5/29 -7/9 when logger was displaced into a dry channel.

C. Stream Morphology Parameter Monitoring

Channel cross-sections established in 2006 were measured in the ten monitoring reaches (5 mainstem and 5 tributary) for each CCAA reach. Cross sections measured width and depth across the channel to determine width to depth ratio, max depth, bankfull area, and channel shape at two locations (1 pool, 1 riffle) at each site (Table 9). These cross sections will be used to track changes and evaluate restoration actions over time.

Table 9. 2010 channel cross section monitoring data from.

Riffle Site	Date	Width/depth ratio	Max Depth	Bankfull Area
BHR CCAA (A)	7/28/10	44.53	2.09	52.87
Governor Creek	7/26/10	44.25	2.26	56.53
BHR CCAA (B)	7/28/10	41.5	2.05	84.67
Miner Creek	8/3/10	31.96	1.56	44.34
BHR CCAA (C)	8/23/10	50.02	2.74	121.59
Rock Creek	8/10/10	26.36	2.14	51.01
BHR CCAA (D)	8/23/10	97.16	3.43	429.13
Steel Creek	8/5/10	99.51	1.96	88.16
BHR CCAA (E)	8/16/10	53.79	5.95	1049.91
Deep Creek	8/6/10	32.71	2.76	80.72
Pool Site	**Date**	**Width/depth ratio**	**Max Depth**	**Bankfull Area**
BHR CCAA (A)	8/3/10	6.89	5.01	81.94
Governor Creek	8/3/10	17.22	5.06	66.29
BHR CCAA (B)	7/28/10	9.55	4.23	87.15
Miner Creek	8/3/10	17.24	3.1	71.02
BHR CCAA (C)	8/23/10	23.94	5.29	167.11
Rock Creek	8/5/10	20.43	2.68	37.25
BHR CCAA (D)	8/23/10	40.45	6.47	532.9
Steel Creek	8/5/10	12.85	4.89	103.69
BHR CCAA (E)	8/16/10	39.95	6.93	1169.42
Deep Creek	8/6/10	9.4	4.3	72.49

D. Streamflow Monitoring required by CCAA

In addition to the two USGS real-time streamflow gages located at Management Areas C and D, DNRC continued to operate and maintain three real-time streamflow gages located at the downstream end of Management Areas A, B, and E. In addition DNRC continuously monitored flow eight tributaries and five key irrigation ditches.

E. FWP Monitoring of Compliance with Approved Site-Specific Plans

Monitoring compliance of approved SSPs occurred on four properties in 2010 (Dooling Livestock Company, Upper Big Hole LLC, Johnson Brothers Inc. and Wisdom River Cattle Company) (Table 10). FWP is required to meet with the landowners two times per year to monitor compliance of the SSP. FWP completed compliance monitoring for irrigation diversions, grazing management plans and fish passage and for any evidence of immediate threats of harm or mortality to grayling on the enrolled property. The initial compliance meetings focused on the expectations for monitoring of the riparian grazing and irrigation diversion agreements in the approved SSP. The necessary field forms for documenting actions were provided to the landowners at that time.

Table 10. Summary of compliance site-visits conducted by FWP in 2010.

Date	Landowner	Irrigation withdrawals in compliance with SSP & water rights	Grazing of Riparian Pastures in compliance with SSP	Landowners monitored & documented irrigation withdrawals & riparian grazing as agreed in SSP
7/21/2010	Dooling Livestock Co	Yes	N/A	Yes
9/23/2010	Dooling Livestock Co	Yes	N/A	Allowable Withdrawal: 98.8 * Actual Withdrawal: 3.7 cfs
8/18/2010	Upper Big Hole LLC	Yes	Yes	Yes
9/23/2010	Upper Big Hole LLC	Yes	Yes	Allowable Withdrawal: 128.2 * Actual Withdrawal: 2.3 cfs
6/20/2010	Johnson Brothers, Inc	Yes	N/A	Yes
9/23/2010	Johnson Brothers, Inc	Yes	N/A	Allowable Withdrawal: 69.6 * Actual Withdrawal: 3.0 cfs
6/1-2010	Wisdom River Cattle Co	Yes	Yes	Yes
9/30/2010	Wisdom River Cattle Co	Yes	Yes	Allowable Withdrawal: 79.5 * Actual Withdrawal: 0 cfs

*Attaining maximum water rights (allowable withdrawal) in fall months is difficult, especially in tributaries because of naturally occurring low flows.

F. Landowner Monitoring of Riparian Grazing and Irrigation Diversions for Approved Site-Specific Plans

The Big Hole Grayling CCAA requires that landowners with approved site-specific plans monitor and document irrigation withdrawals at a minimum of every two weeks once a headgate at a legal point of diversion is opened, and when reductions in diversions are required when stream flows in the Big Hole River drop below flow targets (FWP and USFWS 2006). Dooling Livestock Company, Upper Big Hole LLC, Johnson Brothers, Inc. and Wisdom River Cattle Company were required to monitor actions associated with irrigation diversions in 2010.

Landowners with riparian habitat that is considered either “Not Sustainable” or “At Risk” at the time the SSP was approved must monitor the timing of use, duration, herd class and size of herd grazing in those riparian pastures (NRCS 2004). In 2010, Upper Big Hole LLC and Wisdom River Cattle Company were required to monitor actions associated with livestock grazing in riparian areas. Both landowners provided FWP with documentation of the monitoring that occurred in 2010. Dooling Livestock Company was not required to monitor grazing in riparian pastures because all riparian areas on the property were “Sustainable” when the site-specific plan was approved. Johnson Brothers, Inc is not required to monitor grazing in riparian pastures until 2012, when all necessary infrastructure is in place (See Johnson Brothers, Inc. site-specific plan Certificate of Inclusion # Big Hole Grayling CCAA – 0029).

VIII. Progress in Implementing Approved Site-Specific Plans

In 2010, two landowners enrolled in the Big Hole Grayling CCAA began implementing approved ten-year SSPs, and two landowners continued to implement their SSPs. Each SSP contains an implementation schedule for actions designed to enhance conditions for grayling on the enrolled property. The following are summary tables of actions completed in 2010 for Dooling Livestock Company, Upper Big Hole LLC, Johnson Brothers Inc., and Wisdom River Cattle Company (Tables 11 - 14)

Table 11. Summary of actions in 2010 on the Dooling Livestock Company property identified in the Implementation Schedule of the SSP.

Conservation Measure	Location	Expected Date of Implementation	Actual Date of Implementation
Surveys for Entrained Grayling	Selected portions of the irrigation ditches throughout enrolled property	2010	(Little Swamp ditch surveyed 7/21/10, 0.05 miles, 0 grayling) (Big Hole ditch surveyed 7/21/10 0.26 miles, 0 grayling) (FS boundary ditch surveyed 7/26/10, 0.46 miles, 0 grayling) (Cow Camp ditch surveyed 7/26/10, 0.38 miles, 0 grayling)
Compliance monitoring	Enrolled property	Biannually 2010	7/21/10 and 9/23/10
Improvements to irrigation control structures and installation of flow measuring devices at four points of diversion on Little Swamp Creek	4 points of diversion on Little Swamp Creek	By 2014	2 improvements were completed in 2010 on Little Swamp Creek
Installation of fish passage devices in Berry Creek and Little Swamp Creek*	All diversions owned and operated by the Participating Landowner on Berry Creek and Little Swamp Creek that do not allow for fish passage	By 2014	1 diversion on Berry Creek was fitted with a fish passage device in 2010

Table 12. Summary of actions in 2010 on Upper Big Hole LLC identified in the Implementation Schedule of the SSP.

Conservation Measure	Location	Expected Date of Implementation	Actual Date of Implementation
Compliance Monitoring	Enrolled property	Bi-annually starting in 2010	8/18/2010 and 9/13/10

Table 13. Summary of actions in 2010 on Johnson Brothers Inc. identified in the Implementation Schedule of the SSP.

Conservation Measure	Location	Expected Date of Implementation	Actual Date of Implementation
Compliance Monitoring	Enrolled property	Bi-annually starting in 2010	6/20/10 and 9/23/10

Table 14. Summary of actions in 2010 on Wisdom River Cattle Company identified in the Implementation Schedule of the SSP.

Conservation Measure	Location	Expected Date of Implementation	Actual Date of Implementation
Compliance Monitoring	Enrolled property	Bi-annually starting in 2010	6/10/2010 and 9/30/2010

IX. Summary of Estimated Take Associated with the Big Hole Grayling CCAA

In 2010, the USFWS determined that listing the upper Missouri River basin Distinct Population Segment of Arctic grayling, as threatened or endangered under the Endangered Species Act is warranted, but precluded (Reference FR). Due to the current legal status of grayling, ESA-defined take (harm, harass or kill) did not apply to the implementation or monitoring of the Big Hole Grayling CCAA in 2010.

X. NRCS Special Funding

NRCS continued to support the CCAA through the EQIP Program. EQIP has been used to fund numerous restoration and infrastructure improvements that are part of the Participating Landowners SSP.

X. Literature Cited

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